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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/039,927	03/16/98	LESTER H	A-63098-1/RF

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EXAMINER	
PAK,M	
ART UNIT	**PAPER NUMBER**
1646	12

DATE MAILED: 03/15/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/039,927	Lester et al.
Examiner	**Group Art Unit**
Michael Pak	1646

☒ Responsive to communication(s) filed on *Dec 20, 1999* .

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *18* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *18* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *5*

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

1. The amendment filed 20 December 1999 (Paper No.10) has been entered.

2. Applicant's election of Group II, claim 17 in Paper No. 10 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The requirement is still deemed proper and is therefore mae final.

Specification

3. The attempt to incorporate subject matter into this application by reference to Lesage et al. is improper because a reference cannot be incorporated by reference.

4. The disclosure is objected to because of the following informalities. Appropriate correction is required.

Page 4, Brief Description of the Drawings, figure legends do not agree with the figures 1-4 labels. For example figure 1a is refered to in the legend on page 4 as Figure 1 and then a-c which is not correct because the figure is labeled figure 1a. Furthermore, figure 2a is refered to in the legend on page 4 as Figure 2 and then a-d which is not correct because the figure is

labeled figure 2a and within figure 2a there are panels a-d. The relationship between the figure legend in the Brief Description of the Drawings on pages 4-5 should be carefully checked to see that it agrees with the labeling of the figures 1-4.

Drawings

5. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claim 18 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 5,744,324 in view of Yatani et al.((12); Science, 1987).

Claims 1-19 of U.S. Patent No. 5,744,324 teach the method of modulating the Kir3.0 channel current activity. Yatani et al. teaches the inhibition of Ach(Ik) potassium channel with PTX and NAD. It would have been obvious to one of ordinary skill in the art to modify the claims of `324 to incorporate the method of Yatani et al. to inhibit the channel currents because of the need to characterize the channels as inward rectifiers of specific characteristics.

8. Claim 18 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 5,734,021 in view of Yatani et al.((12); Science, 1987).

Claims 1-19 of U.S. Patent No.5,734,021 teach the method of modulating the Kir3.0 channel current activity. Yatani et al. teaches the inhibition of Ach(Ik) potassium channel with PTX and NAD. It would have been obvious to one of ordinary skill in the art to modify the claims of `021 to incorporate the method of Yatani et al. to inhibit the channel currents because of the need to characterize the channels as inward rectifiers of specific characteristics.

Claim Rejections - 35 USC § 112

9. Claim 18 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the

specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 18 is directed to heteromultimer, but the heteromultimer species have been incorporated by reference using a reference which is not permissible. The incorporation of essential material by reference to a foreign application or foreign patent or to a publication inserted in the specification is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

The attempt to incorporate subject matter into this application by reference to Lesage et al.(23) is improper because the incorporation of Kir3.2 and Kir3.3 sequences (page 29, lines 5-6) are essential material for the practice of the invention and applicants need to include that essential information.

10. Claim 18 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims

limited to a method using a specifically disclosed Kir3.0 polypeptide such as SEQ ID Nos: 1 and 2 of Kir 3.1/KGA, does not reasonably provide the full scope of enablement for Kir3.2 or Kir3.3. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claim 18 encompasses all DNAs or proteins of Kir 3.2 or/and Kir 3.3 subunits. The specification fails to provide guidance sufficient to make and use claimed proteins or DNA encoding Kir3.2 and Kir 3.3 polypeptides because the attempt to incorporate Kir3.2 and Kir3.3 sequences into this application by reference to Lesage et al.(23) is improper. Thus, no specific sequences are disclosed for claimed proteins or DNA encoding Kir3.2 and Kir 3.3 polypeptides. Without the sequences for the other Kir3.0 subfamily members, it would require undue experimentation to isolate other Kir3.0 members for forming a heteromultimer.

The incorporation of essential material by reference to a foreign application or foreign patent or to a publication inserted in the specification is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material

consists of the same material incorporated by reference in the referencing application. *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

The attempt to incorporate subject matter into this application by reference to Lesage et al.(23) is improper because the incorporation of Kir3.2 and Kir3.3 sequences (page 29, lines 5-6) are essential material for the practice of the invention and applicants need to include that essential information.

11. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what the metes and bounds of the term, Kir3.0, is recited in claim 18. The working examples of making Kir3.1/KGA disclose specific sequences SEQ ID Nos: 1 and 2. One of the factors which distinguishes the Kir3.1/KGA from other g-protein activated inward rectifier potassium channel subunits is the amino acid and nucleotide sequences of SEQ ID NO:1 and 2 discovered by the applicant. However, it is not clear whether the Kir3.1/KGA of the present invention are related to the specific disclosed channels or whether the applicants envision a Kir3.1/KGA which has no known relationship to the specific channels disclosed in the specification. The disclosure in the

specification refers to a specific sequence in a cited reference for Kir3.2 and Kir3.3 (page 6, lines 1-9). One of the factors which distinguishes the Kir3.2 and Kir3.3 from other g-protein activated inward rectifier potassium channel subunits is the specific sequence disclosed on page 6, lines 1-9. However, it is not clear whether the Kir3.2 and Kir3.3 of the present invention are related to the specific disclosed channels or whether the applicants envision a Kir3.2 and Kir3.3 which has no known relationship to the specific channels disclosed in the specification. The disclosure in the specification refers to Kir3.0 as Kir3.1, Kir3.2, or Kir3.3, etc. (page 5, lines 23-24; page 6, lines 26-28). One of the factors which distinguishes Kir3.0 from other g-protein activated inward rectifier potassium channels is the specific reference to Kir3.0 as Kir3.1, Kir3.2, or Kir3.3, etc. (page 5, lines 23-24; page 6, lines 26-28). However, it is not clear whether the Kir3.0 of the present invention are related to the specific disclosed channels or whether the applicants envision a Kir3.0 which has no known relationship to the specific channels disclosed in the specification. Furthermore, Kir3.0 is complicated by the concept of homomultimer and heteromultimer and the timing of the concepts of heteromultimers in the state of the art in relation to the parent applications.

Priority

12. Claim 18 is non-obviously broader than claims in the parent application 08/066,371 and thus are not entitled to benefit of the earlier filing date.

Claims 18 are directed to proteins of Kir 3.2 and Kir 3.3 polypeptides. However, the specification references Lesage et al.(23) as the source for making Kir 3.2 and Kir 3.3 nucleic acid molecules and polypeptides (specification, page 29, lines 5-6). Lesage et al. disclosed Kir 3.2 and Kir3.3 in 1994 which is after the effective filing date of March 21, 1993. To receive priority to parent application (08/066,371) filing date of March 21, 1993, the invention Kir 3.2 and Kir 3.3 of the present application must have been enabled in the parent application. Thus, at the time of the filing date of the parent application, the Kir 3.2 and Kir3.3 had not been disclosed and could not have been used at the time of the parent application. Accordingly, the nucleic acid encoding two or more Kir3.0 polypeptide subunits as well as the heteromultimer Kir3.0 channel composed of any two different combinations of Kir3.0 polypeptide subunit is not supported by the parent application. Although the parent application (08/066,371) does support the homomultimer channel composed of Kir3.1/KGA polypeptide of the disclosed sequence, claim 18 is directed to both homomultimers and hetermultimers, and thus are non-obviously broader than claims in the parent application 08/066,371 and thus are not entitled to benefit of the earlier

filing date.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Yatani et al.((12); Science, 1987).

Yatani et al. teaches the method of reducing the current of Kir 3.0 channel with NAD and PTX (page 209, middle column, first paragraph).

Although Yatani et al. does not call the potassium channel conducting the I(KAch) current Kir 3.0, it is the same channel with same inherent properties.

15. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Karschin et al.((8); PNAS, 1991).

Karschin et al. disclose the 5-HT/5-HT receptor and Ach/Ach receptor activations of I(KAch) inwardly rectifying potassium

channel current (page 5696, figure 2 and 3). Potassium concentration was varied to show decrease in the reversal potential of the Ach induced I(KAch) current (page 5695, second column, middle of the paragraph).

Although Karschin does not call the potassium channel conducting the I(KAch) current Kir 3.0, it is the same channel with same inherent properties. It should be noted that claim 18 encompasses both Kir 3.0 channel as a homomultimer or as a heteromultimer.

16. Claim 18 is rejected under 35 U.S.C. 102(a) as being anticipated by Duprat et al.((22); BBRC, 1995).

Duprat et al. disclose the expression of GIRK1 and GIRK2 alone and in combination by injecting cRNAs into Xenopus oocyte (pages 659-661, figure 1-4). Duprat disclose that expression of GIRK3 and GIRK2 combination does not express any currents (page 660, middle of the upper paragraph), while GIRK2 alone or in combination with GIRK1 expresses an enhanced expression of channels(page 659, figure 1). Duprat disclose that expression of GIRK3 and GIRK1 combination does not express any currents (page 660, middle of the upper paragraph), while GIRK1 alone or in combination with GIRK2 expresses an enhanced expression of channels(page 659, figure 1). Duprat et al. also disclose the decrease of inward rectifier current with Mg++ and ATP (pages 660-661, figures 2 and 4). Duprat et al. disclose the GIRK1,

GIRK2, and GIRK3 nucleic acid cloned in the vector (page 658, methods and material section).

Although not called by the same name, GIRK1 is the same as Kir3.1/KGA, GIRK2 is the same as Kir3.2, and GIRK3 is the same as Kir 3.3. Kir3.0 channel encompasses the formation of homomultimer or heteromultimer of GIRK1 and GIRK2 alone or together. GIRK2 alone or in combination with GIRK1 activates the inward rectifier channel, but co-expression of GIRK2 and GIRK3 results in no currents. Thus, GIRK3 suppresses the expression of GIRK2 currents. GIRK1 alone or in combination with GIRK2 activates the inward rectifier channel, but co-expression of GIRK1 and GIRK3 results in no currents. Thus, GIRK3 suppresses the expression of GIRK1 currents. It should be noted that since the heteromultimer does not receive the benefit of one of the parent application's filing date (see above).

17. No claims are allowed.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pak, whose telephone number is (703) 305-7038. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz, can be reached on (703) 308-4623.

Official papers filed by fax should be directed to (703) 308-4242. Faxed draft or informal communications with the examiner should be directed to (703) 308-0294.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose

telephone number is (703) 308-0196.

Michael D. Pak

Michael Pak
Primary Patent Examiner
Art Unit 1646
2 March 2000